

SPECIFICATION

BE IT KNOWN THAT

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has invented new and useful improvements in a POWERED FISHING REEL of which the following is a specification:

POWERED FISHING REEL

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to fishing reels and more specifically to modification
5 apparatus for powering fishing reels to rewind the fishing reel absent a fish having been
caught.

PRIOR ART

Various fishing reels have been developed fo permit the rewinding of the fishing
line on the fishing reel by electrical power. Such powered fishing reels arre of particular
10 advantage to persons who are physically challenged. One patent which describes such
a fishing reel is the Wenzel Patent, U. S. Patent No. 5,878,523. The powered fishing
reel described in this patent uses two intermediary gears to alternate between manual
and powered operation. Although the system operates satisfactorily, the resulting
fishing reel is a comparatively heavy and cumbersome device.

15 OBJECTS

The objects of this invention are to provide a powered fishing reel as follows:

A powered fishing reel that can raise a fishing line that is wound on the
fishing reel by electrice power.

A powered fishing reel that automatically ceases powered operation when
20 the fishing line is placed under load.

A powered fishing reel that can be alternately manually operated.

A powered fishing reel that is economical and dependable.

A powered fishing reel which is simple to operate.

A powered fishing reel which is comparatively light in weight.

SUMMARY OF THE INVENTION

5 A powered fishing reel is provided which permits both motorized operation and manual operation of the fishing reel. The powered fishing reel has an enclosure with a spool mounted to rotate on the enclosure. A hollow shaft with a power end and a manual end is mounted to rotate in the enclosure. The hollow shaft has a concentric opening through it. Means connect the hollow shaft with the spool to rotate the spool. A manual shuttle is mounted to slide into and out of the concentric opening at the 10 manual end of the hollow shaft and to engage the hollow shaft to rotate the hollow shaft. A crank handle is mounted on the manual shuttle. A power shuttle is mounted to slide into and out of the concentric opening at the power end of the hollow shaft to rotate the hollow shaft. Means are also provided to remove the manual shuttle from the hollow shaft when the power shuttle engages the hollow shaft. A motor assembly 15 includes an electric motor and an upper member and a mount shaft. The mount shaft is mounted to rotate in the enclosure. A gear assembly is also mounted in the enclosure. The gear assembly is connected to the power shuttle. An electrical circuit includes a switch and a power source. The electrical circuit is connected to the electric motor to energize the electric motor. The electric motor has a 20 power shaft and a gear is mounted on the power shaft. Means are also provided to actuate the switch and engage the gear mounted on the power shaft of the gear assembly and also to engage the power shuttle with the hollow shaft.

DESCRIPTION OF THE FIGURES

FIG. 1 is a perspective view from the side of the fishing reel showing the fishing reel affixed to a fishing pole with the handle of the fishing pole broken away to show the battery used to supply electrical power.

5 FIG. 2 is a conceptual cross-sectional view showing the fishing reel set for manual operation.

FIG. 3 is a conceptual cross-sectional view similar to FIG 2 but with the fishing reel set for powered operation.

10 FIG. 4 is a side view of the electric motor and worm gear rotated away from the reduction gear.

FIG. 5 is a side view of the electric motor and worm gear similar to FIG. 4 but with the worm gear engaging the reduction gear.

FIG. 5A is a view similar to FIG. 5 but further showing the opening in which the motor assembly rotates.

15 FIG. 6 is a front elevation of the fishing reel showing the finger grip for engaging and disengaging the bevel gears.

FIG. 6A is a front elevation showing the worm gear and the motor assembly detached from the fishing reel.

20 FIG. 7 is a front elevation similar to FIG. 6 but with the motor assembly in place and showing the interaction of the pad which is included in the motor assembly engaging the finger hook.

FIG. 8 is a side elevation of the finger hook with the bevel gear and reduction

gear.

FIG. 9 is schematic electrical circuit for the electrically powered fishing reel.

FIG. 10 is a side elevation similar to FIG. 8 but showing the power bevel gear and the switch with the finger hook off the pawl.

5 FIG 11 is a view similar to FIG. 10 but with the finger hook held on the pawl.

DESCRIPTION OF THE NUMERALS

NUMERAL	DESCRIPTION
11	Fishing Pole
13	Handle
10 15	Mounting Post
17	Battery
19	Manual Fishing Reel
21	Power Assembly
23	Electric Motor
15 25	Spool
27	Fishing Line
29	Finger Hook
31	Hollow Shaft
33	Bearings
20 35	Enclosure
37	Exterior
39	Concentric Opening

	41	Two Ends
	43	Power End
	45	Manual End
	47	Power Shuttle
5	49	Manual Shuttle
	51	Shift Shuttle
	55	Exterior Surface
	57	Crank Handle
	59	Power Bevel Gear
10	61	Shaft Bevel Gear
	63	Shaft
	65	Reduction Gear
	67	Worm Gear
	69	Power Shaft
15	71	Motor Assembly
	73	Mount Shaft
	75	Opening
	77	Support Frame
	81	Face Plate
20	83	Outer Edge
	85	Two Support Rods
	87	Upper Member
	89	Ends of Support Rods

	91	Edge
	93	Pad
	95	Hub
	97	Contact
5	99	Linkage
	101	Pivot Point
	103	Prongs
	105	Linkage Spring
	106	Circuit Board
10	107	Switch
	108	Mounting Plate
	109	Notch
	111	Pawl
	113	Switch Plate

15 **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring now to FIG. 1 a fishing pole 11 is shown having a handle 13. The powered fishing reel is mounted on the handle 13 by a mounting post 15. A battery 17 is shown in FIG. 1 mounted in the handle 13. The powered fishing reel is constructed on an existing manual fishing reel 19 by adding the power assembly 21 to it. The purpose of the battery 17 is to energize an electric motor 23 as will be subsequently explained herein. The powered fishing reel has the usual spool 25 for winding a fishing line 27 which is raised and lowered by rotation of the spool. A finger hook 29 is

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shown which when pulled converts the operation of the spool 25 to wind up the fishing line 21 from manual to powered. The finger hook 29 is but one of several devices which could be used to commence powered operation.

Referring now to FIG. 2 and FIG. 3, a hollow shaft 31 is mounted in the manual fishing reel 19 to rotate on bearings 23 which are mounted in an enclosure 35. The enclosure 35 as has been stated, is actually a commercially available manual fishing reel 19 which is converted to both powered and manual operation in accordance with this invention. The hollow shaft 31 has an exterior surface 37 which is cylindrical and has a concentric opening 39 through it. The hollow shaft 31 has two ends 41, namely a power end 43 and a manual end 45.

A power shuttle 47 is mounted to slide in and out of the the power end of the hollow shaft. A manual shuttle 49 is mounted to slide in and out of the manual end 43 of the hollow shaft 31. Between the power shuttle 47 and the manual shuttle 49, a shift shuttle 51 is located. The shift shuttle 51 slides back an forth inside the concentric opening 39. The shift shuttle 51 to slide without connecting to either the power shuttle 47 or the manual shuttle 49 but in contact with both the power shuttle 47 and the manual shuttle 49.

The concentric opening 39 has a multi-faced cross-sectional configuration, preferably a hexagonal shape, at least at the power end 43 and at the manual end 45. Both the power shuttle 47 and the manual shuttle 49 have an external surface 55 with the same multi-faced cross sectional as the concentric opening 39 in the hollow shaft 31. Mounted on the manual shuttle 49 is a crank handle 57. The crank handle 57 is secured to the manual shuttle 49 to rotate the manual shuttle 49. Mounted on the

power shuttle 47 to rotate the power shuttle 47 is a power bevel gear 51.

The power bevel gear 51 is activated by a shaft bevel gear 47 mounted on a shaft 63. At the opposite end of the shaft 63 is a reduction gear 65 which turns the shaft 63 and the shaft bevel gear 61. The reduction gear 65 is driven by a worm gear 67 which is affixed to the power shaft 69 of the electric motor 23. The electric motor 23 is part of a motor assembly 71 mounted on a mount shaft 73 to permit the motor assembly 71 to pivot so that the worm gear 67 can engage with and disengage from the reduction gear 65. The motor shaft 73 pivots in an opening 75 which is located within a support frame 77 which is affixed to the manual fishing reel to provide a structure for the power assembly 21. The motor assembly 71 is weighted to move the worm gear 67 toward the reduction gear 65.

As part of the motor assembly (FIG.6) a face plate 81 is mounted on the electric motor 23 with the power shaft 69 extending through it. The face plate 81 has an outer edge 83. Two support rods 85 extend beyond the worm gear 67 and in a spaced relationship to the power shaft 69 and worm gear 67. The two support rods 85 are provide structure for the motor assembly 71. The two support rods 85 are parallel to one another and parallel to the power shaft 69. An upper member 87 is secured to the ends 89 of the two support rods 85 remote from the electric motor 23. The mount shaft 73 extends from the two support rods 85 at a point beyond the worm gear 67 toward the upper member 87 and generally at right angles to the worm gear 67. At the edge 91 of the upper member 87, remote from the electric motor 23, is a pad 93 which extends generally at right angles to the upper member 87.

A hub 95 is mounted on the power shuttle 47. A contact 97 is used to activate

the electric motor 23 when the hub 95 is used to engage the power shuttle 47 with the hollow shaft 81. A linkage 99 engages the hub 95 to move the hub 95 and the power shuttle 47 into and away from the hollow shaft 51. The linkage 99 is mounted on a pivot point 101. The linkage 99 (FIGs. 2, 3, 6, 7 and 8) is a L-shaped member
5 mounted to pivot at the center with the finger hook 29 at one end and with prongs 103 to engage the hub 95. A linkage spring 105 forces the linkage 99 to pull the hub 95 and the power shuttle 47 away from the hollow shaft 31.

A circuit board 106 (FIG. 7) is connected to a switch 107 which is located adjacent the contact 97 and when the hub 95 is in the retracted position from the hollow
10 shaft 31, the switch 107, which is normally closed, is opened by the contact 95 when the finger hook 29 is withdrawn and the hub 95 and power shuttle 47 are moved toward the hollow shaft 31 to engage the power shuttle 47 with the hollow shaft 31. The circuit board 106 is mounted on a plate 108. When the switch 107 is closed, the electric
15 motor 23 is actuated. Since the activation of the electric motor 23 is simultaneous with the engagement of the power shuttle 47 with the hollow shaft 31, the hollow shaft 31 is rotated by the electric motor 23. More specifically, as the worm gear 67, which is mounted on the power shaft 69, turns it actuates the reduction gear 65 thereby turning the shaft 63 and the shaft bevel gear 61 and the power bevel gear 59

As has been previously discussed, when the finger hook 29 is
20 held in its extended position by placing a notch 109 in the finger hook 29 on a pawl 111. When the finger hook 29 is pulled out and the notch 109 is placed on the pawl 97, the finger hook 29 comes into contact with the pad 93 which rotates the motor assembly 71 about the mount shaft 73. This rotation moves the worm gear 67 against the

reduction gear 65 which causes the electric motor 23 to drive the shaft 63 and the hollow shaft 31.

5 The interaction of the worm gear 67 and the reduction gear 65 is limited in strength to provide for the raising of the fishing line 27 only when the fishing line 27 is empty. The engagement between the worm gear 67 and the reduction gear 65 is not sufficiently strong as to retain the engagement should a fish or other object place a load on the fishing line 27. When a load on the fishing line 27 does occur, the electric motor 23 pivots on the mount shaft 73 causing the pad 93 to move the finger hook 29 so that the notch 109 moves off the pawl 111. The linkage spring 105 moves the
10 linkage to the inactive position causing the contact 97 to open the switch 107 turning off the electric motor 23 and withdraw the hub 95 and the power shuttle from the hollow shaft 31. The manual shuttle can then be placed into the hollow shaft 31 and the crank handle 57 be used to operate the fishing reel. The switch 107 is mounted on a switch plate 113.

15 It is to be understood that the drawings and description matter are in all cases to be interpreted as merely illustrative of the principles of the invention, rather than as limiting the same in any way, since it is contemplated that various changes may be made in various elements to achieve like results without departing from the spirit of the invention or the scope of the appended claims.